Scandinavian authors from this period, who, with
the exception of Levertin who died in 1906, are
developing themselves in other directions.

The Megalithic Yard Reconsidered :
Rods, Poles or Barleycorns?

Anthony Jackson

The standing stones at Callanish on the Isle of
Lewis have rightly been called the Scottish Stone-
henge for here, at the head of Loch Roag, are seven
sets of stone circles that form a magnificent pre-
historic observatory for predicting eclipses. There
are several hundred more such megalithic circles
besides these impressive monuments to be found in
Britain, especially in Scotland. The interesting
thing about these monuments built some three mill-
enia ago is that they are all constructed using a
common standard of measurement: the megalithic
yard of 2.72 feet. This conclusion reached by
Professor Thom after a careful survey of many of
the sites is generally accepted. However, the
problem still remains as to the way that the mega-
lith builders preserved their standard of 32.64
inches. Thom suggests that there must have been
a centre which sent out standard rods but none, alas,
have been found and it seems highly unlikely that
such an organization could have persisted over the
centuries and over such distances in those days.
Others have suggested that the unit must have been
based on the human body, but since the normal vari-
ation is so great, it cannot give the required
metrical constancy despite providing a rough and
ready guide.

The aim of this article is to show that the
solution to this problem is not only simple but it
also explains the apparent complexity of the British

system of mensuration with all its peculiar measures
such as rods, poles or perches.

The system upon which both the megalith builders
and their British descendants relied was widespread
amongst agricultural peoples because it was handy,
reliable and common. The basic unit was the barley-
corn - a natural unit that maintains a relative con-
stancy in length and weight over both space and time.
Consequently, the barleycorn became the standard
means of regulating weights and measures. In order
to operate such a system it was, of course, necessary
to be able to count, and hence it follows that the
larger measures based upon the barleycorn reflected
the arithmetic of the people concerned. The mode
of reckoning raises some interesting questions about
the symbolic values attached to numbers, e.g. whether
binary arithmetic reflects a dualistic view of the
world? Why do Europeans attach such significance
to the number 3?

Nevertheless, there is one major drawback to
using domesticated plants to provide standards and
that is the tendency for selective planting of the
best seed-corn to result in an improved stock.
Such improvement leads to an increase in the length
of the basic unit and hence causes the larger meas-
ures to become much greater since they are integral
multiples of the base unit. Such a process, over
time, makes the so-called standard measures diverge
in absolute terms. Indeed, this is what happened
in Britain and caused discrepancies between one dis-
trict and another. From time to time it became
necessary for the authorities to issue new standards
to try to rectify matters.

In earlier times the British operated a fixed
price system: articles had a given price and taxes
were paid according to standard and traditional
measures. Obviously, if the measures themselves
varied, someone was going to lose out. This could

be most clearly seen with regard to land-tax since
the fields did not change in size but the owners and
tax authorities disagreed about the measured size.
It was to the tax man's advantage to use the smallest
unit since it gave more taxable acres and since the
tax was gathered for the king, yet it was the king
who preserved the standards, there were few monarchs
who could resist the temptation to tinker with the
system.

In Britain, the barleycorn was the basic unit
of length whereby the grains were laid end to end to
give fixed units expressed in terms of the human
body: thumbs, palms, feet, ells and fathoms. This
rule of thumb produced integral measures of so many
multiples of the basic unit, e.g. both the Welsh and
the Saxons took 3 barleycorns to be the length of the
standard thumb and 9 barleycorns to the palm, but
they differed over the foot.   The Welsh reckoned 3
palms to a foot, i.e. 27 barleycorns,while the Saxons
used 4 palms or 36 barleycorns to their foot.   At
this time, a millenium ago, the length of a barley-
corn was 0.37 inches (our reckoning) and hence al-
though they had identical palms, the Welsh and Saxons
had different feet.   Consequently, the higher meas-
ures also varied since the foot was doubled to make
a cubit, trebled for an ell, and so on up to a fur-
long which was used to measure a rood or a quarter
of an acre.   Thus the Welsh and Saxon acres were
different in area, as was the Scottish acre, but it
should be remembered that the pattern of landholding
was also different.

In order to show the development of our systems
of mensuration I will put forward a hypothetical
proto-British system (Table 1).   Now we know that
prior to the Saxons the old British unit was 4
barleycorns to the inch - pes habet palmos iv,
palmus habet digitos iv (Frontinus).   I shall assume
that in Megalithic times they also had a barleycorn

TABLE 1

PROTO-BRITISH SYSTEM (Hypothetical)

Barleycorn unit = 0.255 modern inches

Unit	Multiple	No. seeds	Actual length	Equivalents
Thumb	4x1	4	1.02"	modern inch
Palm	4x4	16	4.08"	modern hand
Span	4x4x2	32	8.16"	
Foot	2x4x4x2	64	16.32"	(2 span)
Short yard	4x4x4x2	128	32.64"	megalithic yard
Ell	5x4x4x2	160	40.80"	(5 span)
Long yard	6x4x4x2	192	49"	(6 span)
Fathom	8x4x4x2	256	5.44'	megalithic fathom
Rod	24x4x4x2	768	16.3'	modern rod

which actually measured 0.255 inches and that it remained more or less constant. We do not know what measures were called then, but they can be given our standard names. What the above table reveals is how the megalithic yard (32.64") is related to our current measurements - a surprising coincidence ! The hypothetical 'short yard' of 2^7 barleycorns is exactly the length of the megalithic yard postulated by Thom. Now, Thom remarks that the megalith builders employed fractions of their yard and it can be seen that the basic measure in this multiplication system is the 'span' of 32 barleycorns which is a quarter of a megalithic yard. Our 'fathom' of 2^8 barleycorns also corresponds to the megalithic fathom and is 8 'spans'. If my assumptions are correct then this seems to solve the problem of how the megalithic standards were maintained: these very ancient Britons also used the barleycorn.

I now wish to show that this system is not so conjectural as it might appear since it is very similar to that employed by the North Saxons. It will be recalled that although the Welsh and Saxons had a different system of reckoning they used a barleycorn of an 'improved' length of 0.37 inches. What then happened to the old system? Clearly, if the Saxons continued to use the British system of reckoning then the acreage of new fields would be larger than corresponding old fields since the units were bigger. Likewise from the taxman's viewpoint, the fields would apparently decrease and give less revenue. Hence, in order to maintain the size of an acre (160 square rods or 1 furlong x 4 rods) it would be necessary to change the arithmetical calculations. Table 2 shows how this can be done while keeping the old lengths as far as possible. The common factor in the North Saxon system is again the span (of 22 barleycorns). Apart from the hand and foot, the other measures correspond closely to the older lengths but do not resemble ours except

TABLE 2

NORTH SAXON SYSTEM

Barleycorn unit = 0.37 modern inches

Unit	Multiple	No. seeds	Actual length	Equivalents
Thumb	3x1	3	1.11"	
Hand	3x3	9	3.33"	
Span	11x2	22	8.14"	
Foot	4x3x3	36	13.2"	
Short yard	4x11x2	88	32.6"	megalithic yard
Ell	5x11x2	110	40.70"	(5 span)
Long yard	6x11x2	132	48.8"	(6 span)
Fathom	8x11x2	176	5.43'	megalithic fathom
Rod	24x11x2	528	16.3'	modern rod
Welsh foot	3x3x3	27	10"	For
Scots ell	5x10x2	100	37"	comparison's
Scots rod	30x10x2	600	18.5'	sake

for the rod.   The table also shows a possible ex-
planation of the Scottish ell (= 100 barleycorns)
and why the Scottish mile and acre were so much big-
ger than the English equivalents up to the 18th
century.   A mile is 320 rods and an acre is 160 rods[2].
Hence, the Scots mile was 1976 yards and the acre was
6104 square yards as opposed to the 1760 yards in the
English mile and 4840 square yards to the acre.

It is not therefore surprising that in the Middle
Ages the variation in the size of the barleycorn led
to some confusion over measures which, to some extent,
was aided and abetted by the monarchs.   However, in
1305, Edward I of England attempted to put matters
right by decreeing that from thenceforth there should
be 3 barleycorns to the inch which, in effect, said
that 1 barleycorn = 0.33 inches.   Edward's decree
thus reduced the unit lengths which simultaneously
increased the taxation on small items but decreased
the tax on large land-holdings - a move calculated
to please the nobles but not the commons.   Never-
theless, a confusion remained over the length of the
yard or the ell for measuring cloth until it was
fixed by Elizabeth I at 45 inches or 'one quarter
of the North Saxon rod that had 15 feet to the rod',
which we know was actually 16.3 feet long.   She
decreed that an ell, as opposed to a yard, was to
be a quarter of 15 new feet!   The reduction in the
size of the ell also happened to benefit her Ex-
chequer since England was a large wool exporter.
The resulting system is shown in Table 3.

The common factor is again the span which is
27 barleycorns long and measures 9 inches.   It can
be seen that in every table the commonest multiples
of the span are x4, x5, x6, x8, which give rise to
the yard, ell, long ell and fathom.   The double
span or cubit has been omitted.   It will be noticed
that the triple span is uncommon although it was
very popular on the Continent;   indeed, the medi-
aeval triple span (27") is equivalent to the Flemish

TABLE 3

MEDIAEVAL & MODERN ENGLISH SYSTEM

Barleycorn length = 0.33 modern inches

Unit	Multiple	No. seeds	Actual length	Equivalents
Thumb	3x1	3	1.00"	
Palm	3x3	9	3"	
Span	3x3x3	27	9"	
Foot	4x3x3	36	12"	
Yard	4x3x3x3	108	36"	(4 span)
Ell	5x3x3x3	135	45"	(5 span)
Long ell	6x3x3x3	162	54"	(6 span)
Fathom	8x3x3x3	216	6'	(8 span)
Rod	11x2x3x3x3	594	16.5'	(22 span)
Chain	4x11x2x3x3x3		66'	(4 rods)
Furlong	40x11x2x3x3x3		220 yds	(40 rods)
Mile	8x40x11x2x3x3x3		1760 yds	(320 rods)

ell.   Now the last two tables show how the factor
11 x 2 came into the modern British system since
it must have been used by the North Saxons as their
common factor.   It enters our modern system with
the rod - the only measure to have remained constant
throughout.   Incidentally, the foot never seems to
have fitted into any system.

It should be stressed that the Proto-British
system is a hypothetical model built on analogous
lines to our own system but there is such a con-
sistency there as to suggest it is correct. Some
supporting evidence may be obtained in another
direction since the barleycorn was also used as a
measure of weight, volume and money. Only one
example is given to illustrate some basic similar-
ities since a fuller description would take us too
far away from the main point I wish to make.

We saw that the basic measure in our Proto-
British system was the span of 32 barleycorns and
it so happens that as late as the 13th century in
England the weight of 32 wheat corns in silver were
a penny-weight.   Twenty such pennies made an ounce
and 12 ounces made a pound sterling.   The standard
coinage was a shilling of 12 pence and 20 shillings
were a pound sterling: a system that lasted until
quite recently although by then the equivalence of
the two pounds had long since vanished.   Another
unit was the silver Mark equal to 160 d. or 13s.4d.
and weighed 8 ounces of silver.   This unit was used
in the taxation of a mark-land or hide (160 acres)
for an acre was a pennyland.   The hide seems to
have been the knight's fee, and when the shires were
divided into hundreds, the shire represented the
fees for a hundred knights.

Scandinavia escaped the feudal system and their
land-tenure system was different but there are some
interesting comparisons to be made between their
old possessions off Scotland : Shetland and Faroes.

In the Faroes the mark (of land) is now approximately two and a half acres, which is 1/64 of the Norman hide of 160 acres that was valued at one silver mark. The Scandinavian mark (used for land, weight and currency) was divided into 8 silver öre and each öre was sub-divided into 3 örtug, and each örtug into 8 paenninger,giving 192 paenninger per mark. The Faroese landmark was taxed at 160 paenninger in the same way as the markland in Britain. However, the Faroes and Shetland were later divided by the Danes into marks, each mark having 16 gylden and each gylden 20 skind, or in other words, there were 320 skind per mark. On the Scandinavian continent, the mark was set as the value of 320 ells of cloth, but it was reduced in the Faroes to 160 ells or 320 sheep skind. Since the ell of cloth was valued at 6 öre in the 13th century, a mark of land was worth 240 marks of money, so it is clear that inflation had set in. On the other hand, the Shetland mark had fallen to half an acre which is another way of coping with inflation by increasing the taxable units. Such changes played havoc with the older systems of measurement and led to ever-increasing discrepancies between the units of weight, length, volume and currency until the introduction of the metric system but even this could not solve the money problem.

This article has tried to show the continuity in our systems of measurement from megalithic times to our own and I have attempted to account for the origin of the megalithic yard and the Scottish ell besides the peculiarities of the English system of mensuration by relating them to the use of the barleycorn as a basic unit. From this exposition it might be deduced that the megalithic people were binary in thinking, that the English liked using 3s, the Scots 10s and the North Saxons 11s. It would thus seem that the Scots were almost before their time but, alas, they were seduced by the Norman 3 which ensnared them into the English system.

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NOTES:

SHETLAND CONFERENCE : APRIL 1975

The third Conference of the Society will be held in
Lerwick, Shetland, from April 7th - 13th, 1975 when
the theme will be Norse Shetland : An Ongoing Trad-
ition. Details are enclosed. Bookings should be
made as soon as possible since accommodation has to
be reserved well in advance. Please send your
application, by 31st January 1975 to J. R. Baldwin,
85, Marchmont Road, Edinburgh, 9.

NORTHERN SCHOLARS LECTURE

Professor S. S. Häskuldsson of the University of
Iceland will give a lecture on "The Novels of
Halldor Laxness" on Wednesday, 6th November 1974
at 5.15 p.m. in the Faculty Room, David Hume Tower,
George Square, Edinburgh, 8.